

1. We Claim

5        1. In a multi-ply wood structure connection including a wood screw fastener and a plurality of wood structural members formed with a first bore comprising; said wood screw fastener including:

- 5        a. a shank having a head end;
- 10      b. a pointed end portion formed on an entering extremity of said shank opposite said head end for insertion through ~~the~~ ~~opening in said metal connector and into~~ said first bore in said wood structural members;
- 15      c. said shank having a threaded shank portion having thread convolutions with an outer diameter greater than the diameter of said first bore and beginning at a first point adjacent said pointed end portion and extending axially along the periphery of said shank to a second point and adapted to form and engage threads in said wood structural member;
- 20      d. said shank having a knurled portion formed with a plurality of knurls having dull edges and having a first point adjacent said second point of said threaded shank portion and extending axially along said shank to a second point and having an outside diameter generally equal to the outer diameter of said thread convolutions in said threaded shank portion and having an inside diameter substantially less than said outside diameter of said knurled portion and equal to or only slightly greater than the diameter of said first bore;
- 25      e. said knurls are formed with a tapered entering portion forming a smooth transition between the inner diameter of said shank and said outside diameter of said knurled portion;
- 30      f. said shank having an unthreaded shank portion having a diameter generally equal to said outside diameter of said knurled portion and having a first point adjacent said second point of said knurled portion and extending axially along said shank a distance substantially greater than the length of said knurled portion ~~and the thickness of said metal connector at said planar portion~~ and terminating at a second point adjacent said head end;
- 35      g. said knurls having said dull edges bend over buckle and crush without severing, a substantial proportion of the wood fibers of the inner portions of said threads formed in said wood structural member;

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5 forming a nominal annular zone of bent over buckled and crushed wood fibers, having an outer diameter nominally greater than said diameter of said unthreaded shank portion and forming a tight fit between said unthreaded shank portion and said nominal annular zone of bent over buckled and crushed wood fibers, of said wood structural members;

10 h. a head integrally connected to said shank at said head end; and  
i. said unthreaded shank portion extending a substantial distance within said wood structural members.

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15 2. In a multi-ply wood structure shear connection including a plurality of wood screw fastener and a plurality of wood structural members comprising; said screw fastener including,

a. a shank having a head end;

b. a pointed end portion formed on an entering extremity of said shank, opposite said head end, having a plurality of thread convolutions and a recess providing a cutting edge for insertion through said metal connector and forming a first bore in said wood structural members and having a selected outer diameter;

20 c. said shank having a threaded shank portion having thread convolutions similar to said thread convolutions on said pointed end portion with an outer diameter greater than said diameter of said first bore and beginning at a first point adjacent said pointed end portion and extending axially along the periphery of said shank to a second end point and adapted to form and engage threads in said wood structural members;

25 d. said shank having a knurled portion formed with a plurality of knurls having dull edges and having a first point adjacent said second point of said threaded shank portion and extending axially along said shank to a second point and having an outside diameter generally equal to the outer diameter of said thread convolutions in said threaded shank portion and having an inside diameter substantially less than said outside diameter of said knurled portion and equal to or only slightly greater than the diameter of said first bore;

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1 e. said knurls are formed with a tap red ent ring portion forming a smooth transition betw en th inner diameter of said shank and said outside diam ter of said knurled portion;

5 f. said shank having an unthreaded shank portion having a diameter generally equal to said outside diameter of said knurled portion and having a first point adjacent said second point of said knurled portion and extending axially along said shank a distance substantially greater than the length of said knurled portion ~~and the thickness of said metal connector at said planar portion~~ and terminating at a second point adjacent said head end;

10 g. said knurls having said dull edges bend over, buckle and crush without severing, a substantial proportion of the wood fibers of the inner portions of said threads formed in said wood structural members forming a nominal annular zone of bent over, buckled and crushed, wood fibers having an outer diameter nominally greater than said diameter of said unthreaded shank portion and forming a tight fit between said unthreaded shank portion and said nominal annular zone of bent over, buckled and crushed wood fibers of said wood structural members;

15 h. a head integrally connected to said shank at said head end; and

20 i. said unthreaded shank portion extending a substantial distance within said wood structural members.

25 3. In a multi-ply wood structure including a wood screw fastener and a plurality of wood structural members as described in claim 1 wherein:

30 a. said wood structural members are trusses having at least one wood member for receipt of said screw.

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4. In a multi-ply wood structure including a wood screw fastener and a plurality of wood structural members as described in claim 2 wherein:  
5 a. said wood structural members are trusses having at least one wood member for receipt of said screw.

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11 5. In a multi-ply wood structure including a wood screw fastener and a plurality of wood structural members as described in claim 1 wherein:  
12 a. said wood structural members are wood beams.

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16 6. In a multi-ply wood structure including a wood screw fastener and a plurality of wood structural members as described in claim 2 wherein:  
17 a. said wood structural members are wood beams.

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21 7. In a multi-ply wood structure including a wood screw fastener and a plurality of wood structural members as described in claim 3 wherein:  
22 a. said wood trusses are roof trusses.

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26 8. In a multi-ply wood structure including a wood screw fastener and a plurality of wood structural members as described in claim 4 wherein:  
27 a. said wood trusses are roof trusses.

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